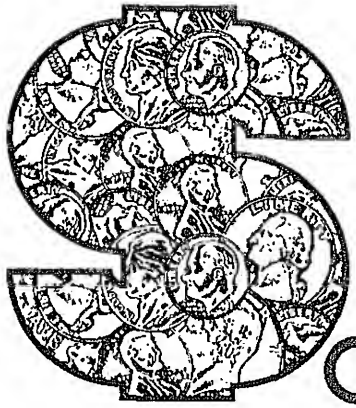

Salary Comparisons of 1979-80 College Graduates, by Sex in May 1981

Jane L. Crane

National Center for
Education Statistics

Analytic Report

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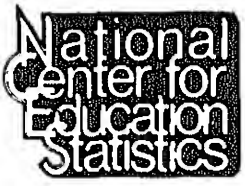

National Center for Education Statistics

"The purpose of the Center shall be to coll
disseminate statistics and other data rela
education in the United States and in other
The Center shall . . . collect, collate, and, fro
to time, report full and complete statistics
conditions of education in the United States;
and publish reports on specialized analyses
meaning and significance of such statistics;
review and report on education activities in
countries."--Section 406(b) of the General Ed
Provisions Act, as amended (20 U.S.C. 1

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Foreword

This report has two purposes. First, it examines the relationship b
background characteristics and salary for males and females who grad
college in 1979-80 and were working in May 1981. Second, it attempt
insight into the causes of the difference in salary which exists bet
sexes 1 year after graduation.

The data for this report are drawn from the 1981 survey of 1979-80 C
Graduates conducted in October 1981. The survey covered individuals
received bachelor's or master's degrees from July 1, 1979, to June
This was a two-stage sample survey. A nationally representative sam
institutions was selected, and from these 15,852 graduates were samp

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December 1984

Executive Summary

The average salary in May 1981 for full-time employed 1979-80 male college graduates was $17,000 compared with $13,400 for females. The first purpose of this report is to examine separately the determinants of salary for those male and female graduates. The se purpose is to investigate the sources of the salary difference betw them.

The data for this report are drawn from the 1981 Survey of 1979-80 College Graduates conducted by the National Center for Education Statistics (NCES). The survey obtained data from a sample of bache and master's recipients 1 year after graduation on items such as employment characteristics, academic history, and general backgroun

Initially, the report examines mean salary, by sex, for each catego (level) of a potential variable. This step establishes a set of sa relevant characteristics. The variables selected for further examination are occupation, major field of study, industry grouping marital status, enrollment status (e.g., graduate school), region, metropolitan status, major field/job-relatedness, degree level, col selectivity, race, and experience.

This step also reveals general patterns in the data. Male and fema salaries follow a pattern similar to two parallel lines rising and falling with changes in the category of a variable. Those variable categories associated with higher (or lower) salaries for men are a associated with higher (or lower) salaries for women, but usually a significant distance apart. In addition, males frequently predomin in the high-paying categories of a variable, while females predomin in the low-paying categories. Occupation and major field of study good examples of this general pattern.

Examining one variable at a time is limited, however. These salary relevant characteristics are highly interrelated, and this type of analysis does not control for the effects of related variables.

A second approach used to deal with the problem of interrelated variables is regression analysis, which permits the effect of one variable to be studied while the other variables are controlled. Separate models are developed for males and females to fulfill the purpose of this study, that is, to examine individually the determi of salary for male and female recent college graduates.

The model for male graduates reveals the following salary-relevant characteristics (values of the predictor variables) to be strongly associated with <u>higher</u> salaries for males:

- Having a master's degree;
- Being employed as a business person, manager, engineer, compute scientist, or health professional; and
- Working in an industry that falls under the heading of either production and trade or transportation, communications, and utilities.

Strongly associated with lower salaries in the male model are the following characteristics:

- Enrolled full-time in college (e.g., in graduate school); and
- Working in a job unrelated to their major field of study.

The model for females reveals the same list of characteristics associated with higher salaries as the model for males, but adds a few others:

- Being employed in fine arts;
- Working in an industry that falls under the heading of insurance, credit, banking and real estate; health service; or government service; and
- Living in the Far West region of the United States.

Those characteristics strongly associated with lower salaries in the female model are:

- Being employed in public affairs or in a non-professional job; and
- Working in a job unrelated to their major field of study.

The unique set of salary determinants for males and females are revealed by examining each model separately. Separate inspection, however, does not address the second purpose of this study; that is, to investigate the reasons for the salary difference between the sexes. Some insight into the sources of their salary difference can be gained in a two-step process of interchanging the elements (regression coefficients and average predictor values) of the two regression equations. First, the regression coefficients in the male and female models are interchanged (male regression coefficients are used with female observations, female coefficients with male observations) and new predicted salaries are obtained. The new predicted salary for females is higher than in the original female model and the new predicted salary for males is lower than in the original male model. What this shows is that males and females change their salary-relevant characteristics into earnings at different rates (females at a lower rate than males). For example, the regression coefficient for an occupation in business and management is lower in the female model than in the male model. This means that women receive a lower rate-of-return (i.e., lower salary) on an "investment" in an occupation in business and management compared to men. Lower rates-of-return on the same salary-relevant characteristics account for about half the difference in salary between these male and female graduates.

In the second step, average values for the predictor variables are interchanged. (One at a time, the average male value for a predictor is substituted in the female equation; then the process is reversed, with the female predictor values being substituted in the male equation). A new predicted salary is calculated after each variable is substituted,

substantially. When the female values for these variables replace the male values, the predicted salary for males decreases by a similar amount. What this shows is that males tend to enter high-paying occupations and industries, while females tend to enter low-paying occupations and industries. This difference in occupation and industry accounts roughly for the other half of the difference in predicted salary between the 1979-80 male and female college graduates in this survey.

Background and Purpose of the Study

Over the years, numerous studies have examined the difference in earnings between men and women. Suter and Miller (1973) found that, while the relationship of income with socioeconomic characteristics is more consistent for women than for men, women receive decidedly lower pay increments for equal step increases in educational level and occupational status. In addition, after taking many factors into consideration (e.g., occupational status), they found that (in 1969) the prevailing wage for women was about 39 percent of that for men. More recently, Beck, et al. (1978a) and others (Bibb and Form 1977; Hodson 1978) accounted for this difference in incomes by examining the different labor markets men and women tend to enter and the different value placed on education and experience within these markets. Similarly, a paper presented at the Economic Council of Canada Conference on Incomes (1979) revealed that full-time Canadian female workers earned 62 percent of the pay received by full-time Canadian male workers. The study showed that female workers earned less than the male workers, because they did not benefit from their income-relevant characteristics in the same way as did the males.

The studies noted above examined the differences in earnings between men and women across all classifications of workers over their entire working lives. This analysis seeks to find out if these same differences exist for full-time employed recent college graduates at the beginning of their careers. These men and women attained their bachelor's or master's degrees in 1979-80 and were surveyed in May 1981, approximately 1 year after graduation.

Proportions of males in each category.

The salary-relevant characteristics used in this study are as follows: occupation, industry grouping, marital status, enrollment status (e.g., graduate school), major field of study, metropolitan status, degree level, region, major field/job-relatedness, college selectivity, race, and years experience. These characteristics were chosen because other studies and preliminary data analysis showed that salaries often varied by these characteristics. Several characteristics may require a definition:

Major field/job-relatedness is a variable aimed at measuring the salary pa for obtaining a job in one's major field. It is measured by a five-catego response (always, frequently, sometimes, rarely, never) to the questionnai item, "How frequently in your principal job did you use the content of cou in your major field?"

College selectivity is a three-category variable (not selective, moderatel selective, and highly selective) based on a composite index from median SA (Scholastic Aptitude Test) or ACT (American College Test) scores, the high school grade-point average of the freshman class, and an "open" admission policy. The index comes from the ACT College Planning Search Book, 1977-7 edition, published by the American College Testing Research Program.

Metropolitan status is a five-category variable: not in standard metropol statistical area (SMSA); small SMSA (not central city); small SMSA (centra city); large SMSA (not central city); and large SMSA (central city).

Data Source

The data for this report come from the 1981 Survey of 1979-80 Colleg Graduates conducted by NCES. The survey obtained data from a sample college graduates 1 year after graduation. The survey used a two-st sample procedure, the first stage being a sample of institutions offering bachelor's and master's degrees and the second being a samp of graduates from the sampled institutions. Graduates in the sample received mail questionnaires with items covering their academic backgrounds, current principal job, and general background. A description of the sampling procedures, sample sizes, response rates and estimation procedures can be found in appendix C.

Because the data were collected from a sample, all figures reported are estimates subject to sampling error. See appendix E for more information.

Geometric Means for Salary

Two steps have become accepted practice in regression analysis invol the relationship between salary and salary-relevant variables. Firs one transforms salary into the logarithmic scale; then one expresses relationship of these variables to salary as a semi-logarithmic func (see Beck et al. 1978a, 1978b; Stolzenberg 1975; Mincer 1974). The of the logarithm of salary is much more consistent with the

hat is ordinarily thought of as an average salary. This is so because
he arithmetic average of the log salaries transformed back to salary by
aking the antilog is not equal to the arithmetic mean of the salaries.
ather, this average is actually the geometric mean. It is neverlarger
han the arithmetic mean. For example, the arithmetic mean salary for
achelor's degree recipients in the sample for this report was $15,160.
he geometric mean for this same group was $14,021.

lthough the arithmetic mean or the median is the measure of central
endency usually associated with descriptive statistics on salary data,
hese measures are not used in this report.

descriptive approach (i.e., examining mean salary by sex for each
alary-relevant characteristic) is included in this report only to
llustrate general trends associated with each variable.

iscussion of these findings is brief since this approach has serious
imitations (see section II). Since the geomtric mean was the preferred
easure for fitting the regression models, all average salaries reported
ere are geometric means to make the report consistent and simple.[3]

Two basic assumptions are implied here:

a. Log salary is a linear function of the salary-relevant characteristics, plus a random error; and

b. The quantity $E(Y-Y')^2$ is the same for all values of X (assumption of homoscedasticity, or the condition of uniform dispersion of points along the regression line).

An obvious advantage of using the geometric mean in the descriptive tables is that it is less affected by extremes in the data than is the arithmetic mean.

A Comparison of the Mean Salary of Males and Females, by Salary-Relevant Characteristics

The average salary in May 1981 for full-time employed 1979-80 male college graduates was $17,000 ($16,100 to $17,900) compared to $13,400 ($12,700 to $14,100)[1] for females. At least part of this difference may be explained by the fact that the salary-relevant characteristics (e.g., occupation distribution) of the two groups differ substantially with males possessing more of those characteristics associated with higher salaries. The salary-relevant characteristics available on the file, as described in appendix A, are: occupation, industry grouping, major field/job-relatedness, degree level, college selectivity, race/ethnicity, years of experience, marital status, enrollment status major field of degree, metropolitan status, and region.

Some insight into the overall salary difference between males and females may be gained by inspecting their differences in mean salary and in category membership for each salary-relevant characteristic (tables B1-B9). This approach is limited, however, by the substantial interrelations among the variables (see appendix D). This problem is best illustrated by an example. Graduates with master's degrees earn considerably higher salaries than those with only bachelor's degrees (table B8). The degree variable, however, is highly correlated with years of experience (r=0.35 for males and 0.47 for females -- tables D and D2).

It is impossible to know, therefore, just by looking at table B8 whether mean salary differences between degree levels are attributed primarily to the degree, to the years of experience that elapsed between earning the degrees, or to both. Nevertheless, some insight may be gained by inspecting these tables[2] (appendix B).

---

[1]These salary ranges are the 95 percent confidence intervals for the average salary estimates. See appendix E for more information.

[2]Some categories of certain variables held only a few graduates. In these categories, the reported mean salaries are subject to greater

In general, occupations that pay better (or worse) salaries for males also pay better (or worse) salaries for females. Engineering,[3] computer science, health professions, and business and management occupations paid salaries at the high end of the salary continuum for both sexes. Education-related occupations and those in public affairs on the other hand, paid salaries at the low end. In most of these occupations, whether high- or low-paying, however, males still earned greater salaries than females.

It is important to note that males and females predominate in differen fields. Females outnumber males by almost 3 to 1 in education-related occupations and by 2 to 1 in public affairs. Females are in the minority in engineering and business and management. In the high-payi health occupations and the computer science field, however, males do n predominate. Women and men are about equal in number in the computer field, and women outnumber men by more than 4 to 1 in the health occupations category (table B1).

For major field of study, a pattern similar to that for occupation exists; that is, male and female salaries fluctuate in parallel but usually a sizable distance apart. Similarly, females, for the most part, predominate in the low-paying categories, males in the high-paying ones (table B2).

The transportation, communication and utilities industry grouping paid salaries at the high end of the continuum for both sexes, while the education service industry paid salaries at the low end. In both thes industry groupings, males earned significantly more than females (tabl B3).

Married males and females earn more than the unmarried, with males earning more than females in both categories (table B4).

Enrollment status appears not to be associated with higher or lower female salaries. Full-time enrollment for males, however, is associat with significantly lower salaries. Full-time enrolled males do not ea significantly different salaries than full-time enrolled females, although part-time enrolled and non-enrolled males do earn significant more (table B4).

Across all metropolitan status and region categories, males than females. For males and females, salaries at the low en continuum were paid in non-SMSA's and at the high end in larg Geographically, salaries at the high end of the continuum for females occurred in the Far West (tables B5 and B6).

---

[3] n=27 for females in engineering occupations. Use caution wi estimate.

- A master's degree adds significant increment to both male and fe salaries. Although males earn more in each category, the ratio bachelor's salary to master's salary is the same for both sexes 75 percent -- table B8).

- Experience appears to be related to male and female salaries sim the more years of experience (as one might expect), the higher t salary. Although males earn more across all categories, graduat the least-experienced category earn 70 percent of those in the m experienced category, regardless of sex (table B9).

Regression analysis is used here for modeling the relationship between the dependent variable (log salary) and the set of predictor variables called salary-relevant characteristics (see appendix A). The regression models proposed for this study assume that log salary is a linear function of the salary-relevant characteristic, plus a random error. Regression analysis overcomes the weakness of the one-variable-at-a-time approach of the previous section by studying log salary for the joint set of salary-relevant characteristics.

The first step in the regression analysis was to develop separate regression models for male graduates and female graduates which fit th observed data.[1] Separate models were created, rather than one with sex as a variable, to permit an examination of the determinants of salary for each sex. Many models were examined before the final model were selected. All of the salary-relevant characteristics available were used in those exploratory models. The final models were chosen because they exhibited the best fit to the data (highest proportion of variance accounted for in log salary) with the fewest possible salary-relevant characteristics. The fit of the models was judged by the coefficient of determination (R^2).

Both male and female models had an R^2 of approximately 0.50.[2] They shared the following predictor variables (each term exceeded the 0.01 level of significance): degree level, years of experience, square years of experience, major field/job-relatedness, industry grouping, metropolitan status and occupation. In the male model, marital status and enrollment status accounted for a significant proportion of the variability in log salary. In the female model, college selectivity and region accounted for a significant proportion of log salary. Thes models are presented in subsequent sections.

After the regression models were established, it was possible to analyze the determinants of male and female log salaries by examining the relative effect on salary of each of the predictor variables in th model. This was accomplished by establishing an arbitrary reference group (graduates who shared membership in the largest category of each predictor variable) and noting the predicted salary of this group. On characteristic of the reference group was then changed, and the new predicted salary was noted. The percentage change from the first salary to the second showed the relative and isolated effect of this one characteristic on the salary of the reference group.

---

[1] Regression coefficients and their standard errors for these models are found in appendix F.

[2] Under cross-validation, using the same regression equation, R^2 would be expected to be lower.

another category results in a specific increment (or decrease) in log salary for the model. When the log salary is transformed to salary, the change is a percentage change. These percentage changes in the model are the focus of sections III B and C.

After the determinants of male and female log salaries have been established, the decomposition-of-means technique (Althauser and Wigler 1972; Winsborough and Dickinson 1971) is used to account for their difference in salary (section III D). With this technique, the difference in mean salary for males and females is divided into two components: one is associated with differences in salary-relevant characteristics (the predictor variables in the model); the other is associated with rate-of-return on those characteristics (the regression coefficients[3] associated with each independent variable).

These components are derived in a two-step process of interchanging the elements (regression coefficients and average predictor values) of the two regression equations. First, regression coefficients in the male and female models are interchanged (male regression coefficients are used with female observations; female regression coefficients are used with male observations). New predicted salaries are thus obtained. This step will show whether or not males and females change their salary-relevant characteristics into earnings at the same rate. If females, for example, have a higher predicted salary using the male regression coefficients while retaining their own characteristics (average female predictor values), this step will show that males receive a higher rate-of-return on a given set of characteristics compared to females.

In the second step, average values for the predictor variables are interchanged. (One at a time, the male average value for a predictor is substituted in the female equation; then the process is reversed, with the average female predictor values being substituted in the male equation). A new predicted salary is calculated after each variable is substituted and changes in predicted salary are noted. This step will show the impact on salary of the different salary-relevant characteristics of each sex. For example, if the male's occupational distribution is substituted for the female's and the predicted salary for females increases, this step will show that male occupational characteristics contribute to their higher salary.

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[3]Note that a different combination of predictor variables could yield significantly different regression coefficients. Regression coefficients for these predictors and the standard errors are found in appendix F.

for 50 percent of the variability in log salary. All of the variables[4] that follow were included in the model (each term exceede the 0.01 level of significance): marital status, degree level, yea of experience, the square of years of experience, major field/job-relatedness, industry grouping, metropolitan status, enrollment status, occupation. Also included were these interactio terms: (square of years of experience) x (occupation), (occupation (metropolitan status), and (occupation) x (race/ethnicity).

After the models were established, it was possible to analyze the effect on salary of the different categories of the salary-relevant characteristics. This was done by measuring their relative effect the predicted salary of an arbitrary reference group. The characteristics of the reference group to which all category change were compared were: bachelor's degree, zero years of experience, education occupation, large SMSA (non-central city), high degree of major field/job-relatedness, (i.e., almost always used major field coursework on the job), education service industry, not enrolled, n married, white race, and education major. The magnitude of the eff on salary of the reference group of a particular predictor/category depicted by changing one characteristic of this reference group and comparing the percent difference in salaries before and after the change. Table 1 shows the percent change in salary due to changing category of one predictor variable from the reference group. Detai of how these changes were calculated are summarized below.

---

[4]Race was also included by itself, since this was a hierarchical model, but it was not significant. Major field (grossly separated into education/noneducation) was included to account for the oversampling of education majors. It also was not significant.

Predictor variable	Change in level of predictor variable	Salary due to change in level of predictor variable
Degree	Bachelor's to master's	+29
Experience	For each year	+ 3
Occupation	In education to occupation in business and management	+26
	In education to occupation in engineering	+53
	In education to occupation in health	+59
	In education to occupation in public affairs	- 2
	In education to occupation in biological and physical science	+26
	In education to occupation in fine arts	+21
	In education to occupation in social science and psychology	+ 6
	In education to occupation as research worker	+ 3
	In education to occupation in communications	+17
	In education to occupation as computer scientist	+39
	In education to occupation as technician	+20
	In education to occupation in other professional category	+37
	In education to occupation in nonprofessional category	+20
Industry grouping	Education service to production and trade	+23
	Education service to transportation, communications, utilities	+29
	Education service to insurance, credit, banking, real estate	+ 6
	Education service to entertainment and service (including: personal, business, and repair)	+15
	Education service to health service	+ 5
	Education service to legal, social, and miscellaneous service	+ 6
	Education service to government service	+10
Metropolitan status	Large SMSA (not central city) to not in SMSA	- 3
	Large SMSA (not central city) to small SMSA (central city)	- 5
	Large SMSA (not central city) to small SMSA (not central city)	- 4
	Large SMSA (not central city) to large SMSA (central city)	+ 2
Major field/ job-relatedness, defined by: Use of major field course-work in principal job	Almost always to frequently	+ 1
	Almost always to sometimes	- 1
	Almost always to rarely	- 9
	Almost always to never	-17
Enrollment status	Not enrolled to full-time enrolled	-17
	Not enrolled to part-time enrolled	- 3
Marital status	Not married to married	+11

added to the intercept if the reference group possessed that characteristic. As an example of estimating the percent change that would occur if one characteristic of the reference group were altered consider the change from bachelor's degree to master's degree in the reference group (+29 percent). To arrive at this percent, one must:

1. Transform the log salary for the reference group to actual salary (9.37 log dollars to 11,731 actual dollars).

2. Transform to actual dollars the sum of the log salary for the reference group and the coefficient in log dollars for master's degree (9.624 log dollars (9.37 + 0.254) to 15,123 actual dollars).

3. Calculate the percent change in actual dollars ((11,731-15,123)/11,731)x100 = 29 percent.

Unfortunately, table 1 does not provide a direct method of measuring the percent change in salary resulting from the change from the reference group in two or more predictor variables. This must be kep in mind when looking at the results of table 1. This comparison to reference group technique can be found in Burkheimer, Jaffe and Peng 1980. See section III-A for a discussion of this technique.

The following predictor/category changes[5] are associated with large percent decreases in male salary (relative to the reference group):

- almost always using to never using major field coursework on job. (-17 percent);
- not enrolled in college to full-time enrolled (-17 percent).

The following predictor/level changes[6] are associated with large[7] percent increases in male salary (relative to the reference group):

- bachelor's degree to master's (+29 percent);
- occupation in education to occupation in business and management (+26 percent);
- occupation in education to occupation as engineer (+53
- occupation in education to occupation as computer sc (+39 percent);

---

[5]Only changes involving cell sizes (seen in tables B than n=40 are discussed.

[6]See note 5 above.

[7]When the salary for a predictor/category was considerably below the male mean, e.g., education occupation (as seen in tables B1-B9), a larger percent increase was necessary to merit discussion.

- education service industry to transportation, communications, util industry (+29 percent).

Regression Model for Females

In this section, the determinants of female log salary are established. variables included in the female regression model explained 47 percent o variability in log salary. All of the variables and interaction terms l below were included in the model (each exceeded the 0.01 level of significance): degree level, years of experience, squared years of exper major field/job relatedness, selectivity of college[8] metropolitan status occupation, region, industry grouping, (race/ethnicity) x (region), (deg (race/ethnicity), (occupation) x (SMSA status).[9]

Table 2 shows how much a particular predictor/category can affect the sa of the reference group. The characteristics of the reference group to w all category changes are compared were: bachelor's degree, zero years of experience, education occupation, large SMSA (not central city), high le major field/job-relatedness (i.e., almost always used major field course on the job), education service industry, moderately selective college, w race, majored in education, Mideast region of the U.S. (See section III details on how, by altering one category of one variable in the referenc group, the percent change in salary was calculated.)

The following predictor/category changes[10] are associated with large per decreases in female salary (relative to the reference group):

- occupation in education to occupation in public affairs (-10 perce
- occupation in education to occupation in nonprofessional category (-10 percent);
- almost always using to never using major field coursework on job (percent).

---

[8]Exceeded 0.05 level of significance.

[9]Race/ethnicity was also included by itself, since this was a hierarchi model, but it was not significant. Major field, grossly separated int education/non-education, was included to account for the oversampling education majors. It was significant at the 0.0001 level.

[10]Only changes involving cell sizes greater than n=40 are discussed.

- bachelor's degree to master's (+30 percent);
- occupation in education to occupation in business and management (+14 percent);
- occupation in education to occupation in health (+21 percent);
- occupation in education to occupation as computer scientist (+53 percent);
- occupation in education to occupation in fine arts (+19 percent)
- education service industry to transportation, communications, ut industry (+35 percent);
- education service industry to insurance, credit, banking, real industry (+19 percent);
- education service industry to health service industry (+16 perce
- education service industry to government service industry (+16 percent);
- Mideast to Far West (+11 percent).

The statements preceeding table 1 also apply to table 2. In particula findings refer only to one variable change in the reference group.

Decomposition of Means for Salary

The decomposition-of-means technique is discussed in section III A. used to predict what the mean female salary would be if females: (1) their salary-relevant characteristics into earnings at the same rate and (2) possessed some of the more important male salary-relevant characteristics. It is also used to predict the mean salary for males did the same: that is, if males changed their salary-relevant charact into earnings at the same rate as females and possessed some of the mo important female salary-relevant characteristics. This approach parti the log salary difference into two portions: the one due to differenc salary-relevant characteristics (predictor variables), and the one ass with differences in rate-of-return on those salary relevant-characteri (regression coefficients). All findings are valid only if the regress models are appropriate.

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[11] See note 10 above.

[12] When the reference group predictor/category salary was considerably below the female mean (as seen in tables B1-B9), a larger percent i was necessary to merit discussion.

using the female model

Predictor variable	Change in category of pridictor variable	Percent change in salary due to change in level of predictor variable
Degree	Bachelor's to master's	+30
Experience	For each year	+ 2
Occupation	In education to occupation in business and management	+14
	In education to occupation in engineering	+57
	In education to occupation in health	+21
	In education to occupation in public affairs	-10
	In education to occupation in biological and physical science	-11
	In education to occupation in fine arts	+19
	In education to occupation in social science and psychology	+ 5
	In education to occupation as research worker	+43
	In education to occupation in communications	-12
	In education to occupation as computer scientist	+53
	In education to occupation as technician	+11
	In education to occupation in other professional category	- 2
	In education to occupation in nonprofessional category	-10
Industry grouping	Education service to production and trade	+13
	Education service to transportation, communication, utilities	+35
	Education service to insurance, credit, banking real estate	+19
	Education service to entertainment and services (including: personal, business, and repair)	+13
	Education service to health service	+16
	Education service to legal, social and miscellaneous service	+ 6
	Education service to government service	+16
Metropolitan status	Large SMSA (not central city) to not in SMSA	- 2
	Large SMSA (not central city) to small SMSA (central city)	- 4
	Large SMSA (not central city) to small SMSA (not central city)	- 1
	Large SMSA (not central city) to large SMSA (central city)	- 2
Region	Mideast to New England	- 1
	Mideast to Great Lakes	+ 8
	Mideast to Plains	+ 5
	Mideast to Southeast	+ 4
	Midoast to Southwest	+ 7
	Mideast to Rocky Mountains	+ 9
	Mideast to Far West	+11
Major field/ job-related-ness, defined by: Use of major field course-work in principal job	Almost always to frequently	- 1
	Almost always to sometimes	- 2
	Almost always to rarely	- 7
	Almost always to never	-13
College selectivity	Moderately selective to not selective	- 2
	Moderately to highly selective	+ 2
Major	Education to noneducation	+ 7

salary ... is predicted salary is approximately 80 percent.

In partitioning the log salary difference, first the effect of rate is accounted for. If average values for female salary-relevant characteristics are used with the regression coefficients in the ma we see the effect of male rate-of-return on female salary. The exp female salary would increase by $1,500 if females got the same retu on their salary-relevant characteristics. This implies that, based model, the rate-of-return accounts for more than 40 percent of the between male and female predicted salaries.

Next, the effect of different salary-relevant characteristics is ex Still using the male regression coefficients and substituting avera occupational and industry characteristics for the female values rea expected salary increments of $1,000 and $700, respectively. The r difference is the expected increment due to all other substitutions characteristics.

Males can expect to lose $2,100 (60 percent of their salary advanta earned for their characteristics at the same rate as females. This using the same approach in reverse (that is, average male salary-re characteristics with the female regression coefficients). If the m occupation distribution were the same as the females', they would lose another $800. Women's industry distribution likewise results $400 decrease (table 4).

Both the male and female models show that roughly half the differen predicted salaries between male and female recent college graduates attributed to differences in salary-relevant characteristics (espec occupation) and half to rate-of-return on those characteristics. T depends upon the variables available from the survey and the regres chosen. Other studies with different sets of data could result in findings.

Model	Mean salary	Expected change in salary due to model	Rat give to p mal
Actual mean female salary	$13,400	-	0
Predicted mean female salary			
Model using male regression coefficients	14,900	+1,500	
Model using male regression coefficients and male occupational distribution	15,900	+1,000	
Model using male regression coefficients, male occupational distribution, and male industrial distribution	16,600	+700	
Actual mean male salary	17,000	+400	
Predicted mean male salary	16,900	-100	

-Not applicable.

Model	Mean salary	In salary due to model	model to predic female salar
Actual mean male salary	$17,000	-	1.26
Predicted mean male salary			
Model using female regression coefficients	14,900	-$2,100	1.10
Model using female regression coefficients and female occupational distribution	14,100	-800	1.04
Model using female regression coefficients, female occupational distribution, and female industrial distribution	13,700	-400	1.01
Actual mean female salary	13,400	-300	.99
Predicted mean female salary	13,500	+100	1.00

-Not applicable.

his report explores the nature of the salary differences between male and
emale recent college graduates with three approaches. One is a descriptiv
pproach. Comparing the sexes one variable at a time, it reveals two
indings. First, regardless of the background variable, male and female
alaries fluctuate in parallel but usually a sizable distance apart. Secon
n the high-paying occupation and major field categories, men far outnumbe
omen. In the low-paying occupation and major field categories, women far
utnumber men. This partially explains the overall difference in mean male
nd female salaries.

he descriptive approach is limited by the substantial interrelations among
he variables. Since regression analysis controls for this weakness, it
ontributes the other two approaches. In the first of these, male and fema
odels are established. Then the relative effect of each variable category
alary of an arbitrary reference group is isolated. Focusing on major
ariables, the reference group for males consisted of bachelor's recipients
no experienced a high degree of major field/job-relatedness and were empl
n education occupations. The addition of a master's degree for this group
ould increase their salary 29 percent, while a change to a low degree of
ajor field/job-relatedness would decrease their salary 17 percent. The
ollowing occupational changes would increase their salary substantially:
ngineer (+53 percent), to computer scientist (+39 percent), and to busine
nd management (+26 percent). The reference group for females also consis
f bachelor's recipients with an occupation in education who experienced a
igh degree of major field/job-relatedness. The addition of a master's de
or this group would increase their salary by 30 percent, while a change t
ow degree of major field/job-relatedness would decrease their salary 13
ercent. The following occupational changes would increase their salaries
ubstantially: to computer science (+53 percent), to health (+21 percent)
nd to business and management (+14 percent).

n the second regression approach, called the decomposition-of-means
echnique, the difference in predicted mean salary for males and females i
ivided into two components: one associated with the salary-relevant
haracteristics (predictor variables in the model), and the other associat
ith rate-of-return on those characteristics (the regression coefficient
ssociated with each predictor variable). This procedure demonstrates tha
bout half the difference in predicted salary can be attributed to women
hoosing lower-paying industries and occupations. The other half appears
e attributable to a lower rate-of-return for females compared to males on
alary-relevant characteristics.

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Appendixes

Appendix A contains a description of all salary-relevant variables in
report.

Appendix B contains tables B1-B9, which show the frequency distributi
and mean salaries for the salary-relevant characteristics referred to
section II.

Appendix C describes the survey, including the sampling procedures an
response rate.

Appendix D contains tables of correlation coefficients as measured by
Cramer's V to show the interrelationships among the variables. There
a table for males and one for females. The statistic used (Cramer's
is closer to unity for variables that are more closely associated.

Appendix E lists tables of coefficients of variation for totals and
salaries in tables B1-B9. It includes a description of the purpose o
this measure and how to use it.

Appendix F displays the regression coefficients and standard errors i
log salaries of males and females.

(1) Occupation. Fourteen-category variable aggregated from speci on the individual record which used the 1970 Bureau of Census Occupational Classification System. The codes were assigned basis of self-reported occupation. The categories were: busi management; education; engineering; health occupations; public biological and physical science; fine arts; social science an psychology; research workers; communications; computer scient technicians; other professionals; and nonprofessionals.

(2) Industry Grouping. Eight-category variable: transportation, communication and utilities; insurance, credit, banking and r entertainment and services including: personal, business, an health service; legal, social and miscellaneous service; educa service; government service; production and trade.

(3) Marital Status. Two categories: married (living with spouse) other.

(4) Enrollment Status. Three categories: full time, part time, enrolled.

(5) Major Field (for degree that brought respondent into survey). category self-reported variable aggregated from specific codi individual record which used the 1978-79 Earned Degrees Confe for classifying of self-reported major. The categories were: and management; education; engineering; health; public affair services; biological sciences; mathematics; physical sciences psychology; social science; humanities; and other.

(6) Metropolitan Status. Five-category variable aggregated from reported city, county or town, and State, for principal job. categories were: not in SMSA, small SMSA (less than 1 millio population) - central city; small SMSA - not central city; la (greater than 1 million population) - central city; and large central city.

(7) Region. Eight-category variable aggregated from graduate sel location, i.e., State, for principal job. The categories wer England, Mideast, Great Lakes, Plains, Southeast, Southwest, Mountains, Far West.

(8) Major Field/Job-Relatedness. Measured by response to questio on frequency of use of college courses in major field on the (five self-reported subjective categories: almost always, fre sometimes, rarely, never).

*Specific codes for these variables are available in the tape documentation for the 1981 Survey of 1979-80 College Graduat the Statistical Information Office, National Center for Educ statistics, (202) 254-6057.

Research Program's College Planning Search Book, 1977-78 edition. This is a composite index based on median Scholastic Aptitude Test (SAT) scores, ACT scores, or both; on the high school grade-point average of the freshman class; and on an "open" admission policy.

Race/Ethnicity. Self-reported and aggregated with four categories: white, black, Hispanic, and other.

Experience. Refers to years of full-time work experience accumulated before receiving the degree that brought the respondent into the sampl The three categories were: less than 1 year, 1-5 years, more than 5 years.

ble B1.--Frequency distributions and salaries of 1979-80 college graduates sex and occupational category: May 1981

cupational tegory	Male			Female		
	Number (sample size)	Percent	Mean Salary	Number (sample size)	Percent	M sa
tal	376,000 (2,401)	100	17,000	379,600 (3,801)	100	13
Business and management	105,800 (564)	28	18,000	72,500 (415)	19	15
Education	44,400 (596)	12	14,000	119,900 (2,118)	29	12
Engineering	51,700 (256)	14	23,200	5,500 (27)	1	22
Health	7,800 (43)	2	21,000	35,900 (220)	9	16
Public affairs	13,600 (83)	4	12,600	25,100 (170)	7	12,
Biology and physical science	8,900 (43)	2	17,400	2,900 (16)	1	15,
Fine arts	8,000 (35)	2	18,000	6,800 (42)	2	14,
Social science and physics	2,900 (17)	1	16,000	2,000 (12)	-	16,
esearch workers	6,200 (33)	2	14,600	7,300 (35)	2	14,
ommunications	3,300 (17)	1	14,300	6,600 (32)	2	12,
omputer	16,800 (89)	4	22,500	10,600 (56)	3	18,
echnicians	12,300 (75)	3	15,100	14,000 (80)	4	14,
ther Professional	10,000 (51)	3	14,600	4,200 (24)	1	14,
on-professional	84,300 (499)	22	14,700	74,300 (554)	20	13,

timated percent less than 0.5.
ffers significantly from male mean salary at 0.5 level of significance.

.--Estimates based on cell size of

r field tegory	Male			Female		
	Number (sample size)	Percent	Mean Salary	Number (sample size)	Percent	s
l	376,000 (2,401)	100	17,000	379,600 (3,801)	100	1
siness and anagement	116,500 (547)	31	18,500	60,600 (271)	16	1
ucation	48,300 (853)	13	14,700	118,000 (2,561)	31	1
gineering	51,800 (249)	14	22,400	5,600 (25)	1	2
rsing and ealth	11,100 (51)	3	20,800	45,100 (229)	12	1
blic service	10,400 (49)	3	16,700	17,700 (90)	5	1
ological cience	16,400 (79)	4	13,200	8,500 (41)	2	1
thematics	4,600 (23)	1	15,900	4,800 (20)	1	1
ysical cience	11,400 (50)	3	15,400	4,900 (23)	1	1
sychology	7,300 (36)	2	14,500	17,400 (84)	5	1
ocial cience	29,700 (139)	8	14,700	24,700 (109)	7	1
manities	14,300 (63)	4	12,500	31,300 (148)	8	1
ther	54,200 (252)	14	15,800	41,000 (200)	11	1

Ffers significantly from male mean salary at 0.05 level of significance.

e.--Estimates based on cell size of less than n=40 are not reliable. See appendix E for a complete explanation of how to apply sampling errors estimates in this report.

Industrial grouping	Male			Fema
	Number (sample size)	Percent	Mean salary	Number (sample size)
Total	376,000 (2,401)	100	17,000	379,600 (3,801)
Transportation, communications, utilities	19,100 (104)	5	20,300	12,700 (77)
Insurance, credit, banking, real estate	28,600 (135)	8	15,600	23,300 (140)
Entertainment and services, including: personal, business, and repair	39,200 (221)	10	17,900	33,900 (211)
Health service	18,700 (104)	5	17,000	57,900 (381)
Legal, social and miscellaneous service	44,000 (230)	12	16,100	38,600 (250)
Education service	54,200 (659)	14	14,200	129,600 (2,248)
Government service	39,200 (200)	11	17,100	22,200 (126)
Production and trade	133,000 (748)	35	18,200	61,400 (368)

*Differs significantly from male mean salary at 0.05 level of sig

, by Enrollment Status: May 1981

acteristic	Male Number (sample size)	Male Percent	Male Mean salary	Female Number (sample size)	Female Percent	Me sal
otal	376,000 (2,401)	100	17,000	379,600 (3,801)	100	13,
ital status						
arried, living with spouse	167,900 (1,113)	45	19,500	135,600 (1,113)	36	14,
ther	208,100 (1,288)	55	15,200	244,000 (2,345)	64	13,
ollment status						
ıll time	13,000 (87)	3	12,300	9,500 (114)	3	12,
art time	47,500 (322)	13	17,300	46,700 (533)	12	13
ot enrolled	315,500	84	17,200	323,400	85	13

fers significantly from male salary at 0.05 level of significance.

sex and metropolitan status: May 1981

Metropolitan status	Male			Female	
	Number (sample size)	Percent	Mean salary	Number (sample size)	Percen
Total	376,000 (2,401)	100	17,000	379,600 (3,801)	100
Not in SMSA	53,600 (474)	14	14,200	63,100 (913)	17
Small SMSA (central city)	89,800 (545)	24	16,300	93,000 (838)	24
Small SMSA (not central city)	40,500 (309)	11	17,000	34,600 (452)	9
Large SMSA (central city)	106,200 (555)	28	18,200	97,900 (712)	26
Large SMSA (not central city)	85,900 (518)	23	18,500	91,000 (886)	24

*Differs significantly from male salary at 0.05 level of significance.

	Male			Female		
	Number (sample size)	Percent	Mean salary	Number (sample size)	Percent	Mean salary
al	376,000 (2,401)	100	17,000	379,600 (3,801)	100	13,4
ngland	25,100 (152)	7	16,800	22,900 (220)	6	12,9
st	77,900 (445)	21	17,000	88,500 (761)	23	13,7
Lakes	72,800 (464)	20	17,200	72,200 (747)	19	13,8
s	34,900 (236)	9	16,600	34,000 (373)	9	13,0
east	65,200 (436)	17	15,200	77,300 (857)	20	12,4
west	34,800 (267)	9	18,500	38,200 (444)	10	13,7
ntains	15,200 (97)	4	16,000	10,800 (128)	3	13,9
st	50,100 (304)	13	19,100	35,700 (271)	10	15,0

s significantly from male salary at 0.05 level of significance.

in major field on the job: May 1981

of ege rses	Male			Female		
	Number (sample size)	Percent	Mean salary	Number (sample size)	Percent	s
l	376,000 (2,401)	100	17,000	379,600 (3,801)	100	1
most lways	97,600 (664)	26	17,200	123,800 (1,507)	33	1
equently	107,700 (681)	29	18,100	104,700 (1,033)	27	1
metimes	95,800 (585)	25	17,600	82,100 (722)	22	1
rely	50,900 (303)	14	15,200	45,000 (339)	12	1
ver	24,000 (168)	6	13,500	24,000 (200)	6	1

fers significantly from male salary at 0.05 level of significance.

Number (sample size)	Percent	Mean salary	Number (sample size)	Percent	Mean salary
376,000 (2,401)	100	17,000	379,600 (3,801)	100	13,400*
285,000 (1,882)	76	15,800	277,800 (3,011)	73	12,400*
91,000 (519)	24	21,300	101,800 (790)	27	16,800*
76,900 (487)	20	16,900	73,000 (793)	19	13,300*
227,600 (1,498)	61	16,800	244,200 (2,514)	64	13,300*
71,500 (416)	19	17,700	62,400 (494)	17	14,100*
347,000 (2,208)	92	17,000	344,600 (3,477)	91	13,400*
16,500 (103)	4	15,900	24,300 (229)	6	13,400*
5,700 (48)	2	17,700	5,700 (54)	2	13,000*
6,800 (42)	2	19,200	5,000 (41)	1	15,900

icantly from male salary at 0.05 level of significance.

experience	(sample size)	Percent	salary	(sample size)	Perce
Total	396,000 (2,401)	100	17,000	379,600 (3,801)	100
Less than 1 year	199,100 (1,290)	53	15,300	229,400 (2,414)	60
1-5 years	93,300 (550)	25	17,000	85,900 (812)	23
More than 5 years	83,600 (560)	22	21,900	64,300 (575)	17

*Differs significantly from male salary at 0.05 level of significance.

Sample design and estimating procedures

The sample survey of Recent College Graduates conducted in October 19 was the source of the data for this report. The survey used a two-st sampling procedure: the first stage was a sample of institutions offering bachelor's and master's degrees; the second stage was a samp of graduates from the sampled institutions. The institutions were stratified by percent of education graduates, control, and geographic region. The institutions were selected with probabilities proportion to their measure of size, a measure constructed by using the number c graduates and the percent of education graduates.

The graduates within the sampled institutions were stratified by leve of degree, whether or not they were education graduates, and by wheth or not they were special or vocational education graduates. Differen probabilities of selection were assigned to each stratum to obtain th desired sample size of each type of graduate. A questionnaire was mailed to each sampled graduate.

The results of both stages of sampling are shown in table C. The overall response rate was 72.3 percent.

A ratio estimation procedure was used to inflate the sample results t the estimates. The estimates differ from the Higher Education Genera Institutional Survey (HEGIS) numbers that were the basis for the rati because graduates listed with foreign addresses and deceased graduate were removed, and self-reported major was used rather than the institution-reported major.

Table C.--Response rates for the 1981 survey of 1979-80 college graduates

Item	1981 survey
ampled institutions	301
ut-of-scope institutions	4
esponding institutions	286
nstitutional response rate (percent)	96.3
otal sampled graduates	15,852
ut-of-scope graduates	716
esponding graduates*	11,365 (9,312)
raduate response rate (percent)	75.1
verall response rate (percent)	72.3

* The number of responding graduates used includes weighted respondents fr subsamples of what were originally nonrespondents in the survey. The actual number of completed questionnaires is given in parentheses.

Appendix D: Correlation coefficients among variables, using Cramer's V

Table D1.--Correlation coefficients among variables (male)

(Cramer's V coeffici

Variable	Occupation	Industry	Metro-politan status	Region	Major field/ job-related-ness	De
Occupation	1.000	0.408	0.150	0.103	0.212	0.
Industry		1.000	.151	.098	.170	.
Metropolitan Status			1.000	.238	.067	.
Region				1.000	.073	.
Major field/ job-relatedness					1.000	.
Degree						1.
College selectivity						
Race/Ethnicity						
Experience						
Enrolled						
Major Field						
Marital Status						

Appendix D: Correlation coefficients among variables, using Cramer's V

Table D2.--Correlation coefficients among variables (female)

(Cramer's V coefficien

Variable	Occupation	Industry	Metro-politan status	Region	Major field/ job-related-ness	Deg
Occupation	1.000	0.483	0.187	0.116	0.286	0.3
Industry		1.000	.157	.092	.224	.3
Metropolitan Status			1.000	.216	.081	.0
Region				1.000	.070	.0
Major field/ job-relatedness					1.000	.1
Degree						1.0
College selectivity						
Race/Ethnicity						
Experience						
Enrolled						
Major Field						
Marital Status						

Appendix E. Coefficients of Variation for Totals and Salaries for Ta

Table E-1 contains coefficients of variation (CV's) for totals
the CV is merely the standard error of the estimate divided by
estimate). To calculate CV's for totals, follow these steps:
table E1, find the column which comes closest to the category
graduate for which you want a CV. Keep in mind that all estim
this report contain both bachelor's and master's recipients (o
there are three times more bachelor's recipients than master's
very conservative CV, use the master's columns; for a conserva
probably more accurate CV, use the bachelor's columns. (For e
for a conservative CV for the estimate of 72,500 females in bu
management occupations, use the bachelor's column for non-educ
majors.) Calculate the percentage of graduates in class, i.e.
estimate divided by the total master's and bachelor's recipien
category, or 72,500/(788,500 + 180,900) = 7 percent. Using th
percent, locate the CV in the table under the closest row entr
percentage of graduates in class* and the proper group heading
percent calculated does not exactly match the row-entry percen
approximate what the CV should be from the next higher and nex
percents.

Confidence intervals for estimates appearing in this report ca
constructed using these CV's. Continuing the example above, t
the estimated 7 percent in graduating class is approximately 0
Thus, the standard error for this estimate is 6,163 (0.085 x 7
6,163), and a 95 percent confidence interval is 72,500 $\pm$ 12,32

To calculate CV's for salaries, the process is similar but sim
These CV's only apply to salaries in tables B1-B9. Using thes
find the appropriate sample size for the estimate (n) and then
the closest category in table E-2. For example, for males in
occupation (n = 596), use the row entry n = 250 or greater wit
percent. The standard error for the salary estimate of $14,00
group is $350 (0.025 x $14,000 = $350) and a 95 percent confid
interval is $14,000 $\pm$ $700. It should be noted that these est
CV's are very approximate, based upon a few CV's calculated fr
data. For this reason, any sample size under 40 should be con
subject to relatively high variability.

* When the percentage of graduates in class is less than 5 per
table cannot be used.

Table E1.--Coefficients of variation for totals

centage of duates class	Bachelor's graduates				Master's graduates			
	Total N=905,700	Special and vocational education N=31,900	All education N=117,200	Non-education N=788,500	Total N=282,200	Special and vocational education N=18,900	All education N=101,300	Non-educatic N=180,9
5	0.086	0.190	0.137	0.099	0.137	0.278	0.161	0.198
10	.059	.132	.096	.068	.094	.193	.111	.136
15	.047	.106	.077	.054	.075	.155	.089	.109
20	.039	.091	.066	.046	.063	.132	.075	.091
25	.034	.080	.058	.040	.055	.116	.065	.079
30	.030	.072	.052	.035	.048	.104	.058	.070
40	.024	.060	.044	.028	.039	.086	.047	.057
50	.020	.052	.038	.023	.032	.073	.039	.047
60	.016	.045	.034	.019	.026	.064	.033	.039
70	.013	.040	.030	.016	.021	.056	.027	.032
80	.010	.036	.027	.012	.017	.049	.022	.026
90	.007	.032	.024	.009	.012	.043	.018	.019
95	.005	.030	.023	.007	.001	.040	.015	.016
100	.003	.028	.022	.005	.006	.032	.013	.012

Table E2.--Coefficients of variation for salary data

n	CV
250 or greater	2.5 percent
50 to 249	5.0 percent
40 to 49	9.0 percent
Less than 40	Use caution in making comparisons

Parameter	Coefficient estimate	of the
Intercept	9.370	0.
Major field		
1. Education	0	
2. Noneducation	-.001	.
Degree		
1. Bachelor's	0	
2. Master's	.254	.
Experience	.032	.
Experience squared	-.018	.
Major field/job-relatedness, defined by: use of major field coursework on job		
1. Almost always	0	
2. Frequently	.006	.
3. Sometimes	-.009	.
4. Rarely	-.096	.
5. Never	-.186	.
SMSA status		
1. Not in SMSA	-.032	.
2. Small SMSA (central city)	-.050	.
3. Small SMSA (not central city)	-.044	.
4. Large SMSA (central city)	.018	.
5. Large SMSA (not central city)	0	
Occupation		
1. In business and management	.230	
2. In education	0	
3. In engineering	.428	.
4. In health	.467	.
5. In public affairs and service	-.025	.
6. In biological and physical science	.233	.
7. In fine arts	.187	.
8. In social science and psychology	.055	.
9. As research worker	.030	.

-Not applicable

Appendix F1. (Continued)

Parameter	Coefficient estimate	Standard er of the esti
Occupation (continued)		
10. In communications	0.155	0.157
11. As computer scientist	.332	.074
12. As technician	.185	.085
13. In other professional category	.312	.132
14. In nonprofessional category	.183	.053
Race/ethnicity		
1. White	0	-
2. Black	.115	.064
3. Hispanic	.002	.087
4. Other	.168	.134
Industry		
1. Production and trade	.204	.035
2. Transportation, communication, utilities	.253	.045
3. Insurance, credit, banking, real estate	.058	.043
4. Entertainment and services, including: personal, business, and repair	.137	.035
5. Health industry	.049	.047
6. Education service	0	
7. Legal, social and miscellaneous service	.061	.03
8. Government service	.100	.04
Marital status		
1. Married, living with spouse	.106	.01
2. Other	0	
Enrollment status		
1. Enrolled full-time	-.189	.03
2. Enrolled part-time	-.025	.01
3. Not enrolled	0	

- Not applicable
NOTE: Interactions were included in the model, but parameters and effect not presented here.

F2. Female Regression Model

Parameter	Coefficient estimate	Standard error of the estimat
Intercept	9.292	0.015
Major field		
1. Education	0	-
2. Noneducation	.063	.012
Degree		
1. Bachelor's	0	-
2. Master's	.263	.013
Experience	.01	.002
Experience squared	-.007	.002
Major field/job-relatedness, defined by: Use of major field coursework on job		
1. Almost always	0	-
2. Frequently	-.015	.011
3. Sometimes	-.024	.012
4. Rarely	-.070	.017
5. Never	-.135	.022
College selectivity		
1. Not selective	-.020	.011
2. Moderately selective	0	-
3. Highly selective	.017	.013
Metropolitan status		
1. Not in SMSA	-.016	.015
2. Small SMSA (central city)	-.038	.018
3. Small SMSA (not central city)	-.008	.018
4. Large SMSA (central city)	-.024	.020
5. Large SMSA (not central city)	0	-
Occupation		
1. In business and management	.133	.034
2. In education	0	-
3. In engineering	.454	.098
4. In health	.189	.044
5. In public affairs and service	-.110	

upation		
6. In biological and physical science	-0.114	0.132
7. In fine arts	.177	.085
8. In social science & psychology	.053	.120
9. As research worker	.361	.118
0. In communications	-.130	.116
1. As computer scientist	.425	.070
2. As technician	.100	.068
3. In other professional category	-.015	.140
4. In Nonprofessional category	-.107	.033
ion		
. New England	-.005	.020
. Mideast	0	-
. Great Lakes	.079	.014
. Plains	.045	.017
. Southeast	.039	.014
. Southwest	.067	.017
. Rocky Mountains	.086	.025
. Far West	.104	.019
e/ethnicity		
. White	0	-
. Black	-.033	.039
. Hispanic	.039	.092
. Other	.054	.108
ustry		
. Production and trade	.122	.024
. Transportation, communications, utilities	.299	.036
. Insurance, credit, banking, real estate	.178	.030
. Entertainment and services including: personal, business, and repair	.126	.027
. Health industry	.145	.026
. Education service	0	-
. Legal, social and miscellaneous service	.062	.026
. Government service	.150	.030

applicable

-- Interactions were included in the model, but pa
are not presented here.

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